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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,532	11/29/2000	Hiromi Miyamoto	FUJ 17.619 (100794-11510)	1841
26304	7590	10/18/2004	EXAMINER	
KATTEN MUCHIN ZAVIS ROSENMAN 575 MADISON AVENUE NEW YORK, NY 10022-2585			CHANG, EDITH M	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/725,532

Applicant(s)

MIYAMOTO ET AL.

Examiner

Edith M Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 18-20, 22-25 and 27-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6 is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-10, 12-15, 18-20, 22-25 and 27-32 is/are rejected.
- 7) ☒ Claim(s) 5 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments/Remarks

1. Applicant's arguments, see pages 12-15, filed on August 04 2004, with respect to the rejection(s) of claim(s) 1, 3-7, 13, 15-22, 29 and 31 under U.S.C. 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Watanabe.

Drawings

2. Figure 15, Figure 16 (a) to (f), Figure 17 (A) and (B) and Figure 18 (A) and (B) should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, in claims 18, 20, 24 & 27, the amplitude adjuster provided with a splitter splitting input signals into third and fourth subsignals, a delay device, an amplitude adjuster and a combiner must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

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Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 13-15, 18-20, 22-25 and 27-28 are objected to because of the following informalities:

Claims 13 & 14, line 6: "said signals" is suggested changing to "said split signals".

Claim 18, line 2: "adjuster are/is" is suggested changing to "adjusters is" and line 3: "input subsignals" is suggested changing to "the input subsignal".

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Claims 15, 19-20, 22, 23-25 and 27-28 are directly or indirectly depend on objected claims 13 and 14.

Appropriate corrections are required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 10, 19, 20, 22 and 27-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10, lines 1-2: "said second subsignals" lacks antecedent basis.

Claim 19, lines 1-2: "said orthogonal combiner" lacks antecedent basis.

Claim 20, lines 3: the term "a splitter, which splits input signals into mutually orthogonal first, second and a third subsignals" is not understood that how does one of the amplitude adjuster taking the first/second subsignal as input adjusting its amplitude, now comprise a splitter splitting input signals into first and second subsignals. The term "input signals" does not clearly indicate what are the input signals; and the term "the input signals" lacks antecedent basis.

Claims 22 & 28, lines 3 & 5: "the output signal" lacks antecedent basis.

Claim 27, lines 3: the term "a splitter, which splits input signals into first, second and a third subsignals" is not understood that how does one of the amplitude adjuster taking the first/second subsignal as input adjusting its amplitude, now comprise a splitter splitting input

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signals into first and second subsignals. The term "input signals" does not clearly indicate what are the input signals.

Claims 29 & 30, line 4: "said signals" lacks antecedent basis.

Claim 31, line 2: "the pre-stage amplifier", line 3: "said split signals" and "the delay signals" lack antecedent bases.

Claim 32 is directly dependent on rejected claim 30.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4, 7-9, 12-15, 18, 22-25 and 28-30 rejected under 35 U.S.C. 103(a) as being unpatentable over Gentzler (US 6,046,635) in view of Watanabe (JP 62-141824 cited by Applicants).

Regarding **claims 1, 13 & 29**, in FIG.1 and Abstract, Gentzler discloses a predistortion compensation apparatus with a feed forward amplifier (element 14 of FIG.1, column 1 lines 10-15). The apparatus (or device) comprises element 22 splitting the input signal into a first signal (input to element 24) and a second signal on line 36; a splitter (element/coupler 38) splitting the second signal on line 36 into the first subsignal to element 46 and the second subsignal to element 40 wherein the second subsignal gone through the amplifier element 66 adjusting the amplitude; the first and second subsignals combined via element 70 to derive the signal 72 to

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element 14, wherein the first signal on line 78 subtracts from the formed signal 74 (the third subsignal) by the comparator 30 to produce the error signal on line 80 that the first signal on line 78 is cancelled by the formed signal 74 to minimize the error signal.

It is well known that the coupler 38 can have orthogonal polarization mode to provide two outputs with different phase. With the controlled phase circuit 68 to form an in-phase or orthogonal combiner to minimize the error, Gentzler provides the coupler 38 being an orthogonal splitter to produce two mutual orthogonal subsignals in a dynamic manner in the predistortion arrangement (column 3 lines 15-30).

However Gentzler fails to show or suggest that the amplitude of both of the splitted subsignals is adjusted before recombining by the coupler 70.

Watanabe discloses a nonlinear compensation system in Fig.1 comprising at least a divider circuit (element 3), first and second distortion output circuits (elements 20 & 21) and an adding circuit (element 17). The divider circuit divides a signal into two subsignals, a variable attenuator (element 10 or 12) of the distortion circuits adjusts the value or amplitude of the subsignals (refer to Figs.6a and 6b), and the adding circuit recombines the adjusted amplitude of the two subsignals (See the Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art that it is capable to replace Gentzler's delay (element 46) with an amplitude adjustable circuit controlled by the controller (element 90 FIG.1 '635) as taught by Watanabe in order to adjust the amplitude of both the subsignals instead of one subsignal to improve the data transmission of the channel before recombine the two subsignals.

Regarding **claims 2, 14 & 30**, Gentzler discloses a predistortion compensation apparatus with a feed forward amplifier (element 14 of FIG.1, column 1 lines 10-15) and its method in FIG.1 and Abstract. The apparatus (or device) comprises element 22 splitting the input signal into a first signal (input to element 24) and a second signal on line 36; a splitter (element 38) splitting the second signal on line 36 into the first subsignal to element 46 and the second subsignal to element 40 wherein the second subsignal gone through the amplifier element 66 adjusting the amplitude; the first and second subsignals combined via element 70 with the adjustable/controllable phase circuit 68 to derive the signal 72 to element 14, wherein the first signal on line 78 subtracts from the formed signal 74 (the third subsignal) by the comparator 30 to produce the error signal on line 80 that the first signal on line 78 is cancelled by the formed signal 74 to minimize the error signal.

It is well known that the coupler 70 can have orthogonal polarization mode to provide two outputs with different phase. With the controlled phase circuit 68 being able to adjust the phase to minimize the error signal on line 80, Gentzler provides the capability that coupler 70 can be an orthogonal combiner.

Gentzler fails to show or suggest that the amplitude of both of the splitted subsignals is adjusted before recombining by the coupler 70.

Watanabe discloses a nonlinear compensation system in Fig.1 comprising at least a divider circuit (element 3), first and second distortion output circuits (elements 20 & 21) and an adding circuit (element 17). The divider circuit divides a signal into two subsignals, a variable attenuator (element 10 or 12) of the distortion circuits adjusts the value or amplitude of the

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subsignals (see Figs.6a and 6b), and the adding circuit recombines the adjusted amplitude of the two subsignals (see Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art that it is capable to replace Gentzler's delay (element 46 FIG.1 '635) with an amplitude adjustable circuit controlled by the controller (element 90 FIG.1 '635) as taught by Watanabe in order to adjust the amplitude of both the subsignals instead of one subsignal to improve data transmission of the channel before recombine two subsignals.

Regarding **claims 3-4, 8-9, 18 & 24-25**, in FIG.1, Gentzler's device/method with Watanabe's teaching discloses the splitter D₃ or D₄ (element 4 or 5 Fig.1 Watanabe) splitting the second subsignal into the third subsignal on the delay path (7 or 8 Fig.1) and the fourth subsignal on attenuation path (10 or 12 Fig.1) of the same/anti- phase; the element 9 or 9b combining the delayed fourth subsignal from the delay element 7 and adjusted third subsignal via elements 10, 50 and 11.

Regarding **claims 7, 12, 22 and 28**, the modified Gentzler's cancellation device/method with Watanabe's teaching comprising controlling alternatively and repetitively the first adjustment process and the second adjustment process to minimize the output signal as cited in the claims (refer to the rationale of the rejection of claim 1).

Regarding **claims 15 & 23**, in FIG.1, Gentzler discloses the AMPs and PHASEs (elements 52, 60, 62, 66 and 68) being able to reverse the OUTPUT in positive phase or reverse phase.

Allowable Subject Matter

9. Claim 6 is allowed.
10. Claims 5 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
11. Claims 10, 19, 20, 27 and 31-32 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
12. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not teach or suggest, alone or in a combination, among other things, at least a signal cancellation device and its method as a whole, the combination of elements and features as claimed, which includes at least combining the first and second subsignals and a third subsignal having a freely selected phase in the opposite quadrant of the first and second subsignals; a next-stage splitter splitting a portion of the output of the pre-stage combiner, which synthesizes the split signals and the delay signals of the pre-stage.

Conclusion

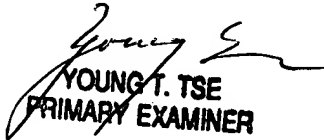
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang
October 12, 2004


YOUNG T. TSE
PRIMARY EXAMINER